

# A New Cynipid Wasp From California

(Hymenoptera)

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A new cynipid wasp, *Andricus stellulus* n. sp. and the distinctive star-headed gall it produces on *Quercus dumosa* Nuttall are described. Illustrations of the wasp and gall are included with notes on biology and habitat.

## BIOLOGY

Live, adult females of the unisexual generation were cut out of galls on 12 January, 1974. Adult emergence began on 19 February from galls kept out-of-doors in rearing containers at Riverside, California. On 24 February and 2 March, adults were found on host twigs and leaves at the collection locality. Both larvae and pupae were cut out of galls on 5 March, indicating that normal emergence may be distributed over a time period of several weeks. Emergence holes made by the gall wasp are usually found in the lateral part of the gall disc while parasites exit through a much smaller hole in the upper-disc surface.

Galls are found attached either to a secondary vein of the leaf blade or occasionally to the midrib and seem to occur on both surfaces with equal frequency. Never protruding to the opposite surface, mature galls are typically associated with a brown necrosis around the point of attachment which extends laterally to the leaf-blade margin.

HABITAT.—The type material was collected from *Q. dumosa* on 12 January near the summit of Cajon Pass, San Bernardino County, California ½ mile South of the junction of U.S. Highway 395 and Oak Hill Road. Cajon Pass occurs in a transition zone at 4190 feet elevation (summit) on the southern edge of the high Mojave desert. Oak is the dominant plant, but desert flora are also present. According to the San Bernardino County Flood Control District, the average yearly rainfall over the last 30 years, for the Cajon Pass area, is 16.74 inches; the 18-year mean temperature is 59.6 deg. F. (R. Luther, pers. comm.). When the type material was collected, there was snow on the ground which lasted through January.

DISTRIBUTION.—The author has inspected *Q. dumosa* at or near the following California locations: Santa Cruz, San Jose, Tejon Pass, Hungry Valley, Corona, Lake Elsinore and Cajon Pass, but except for

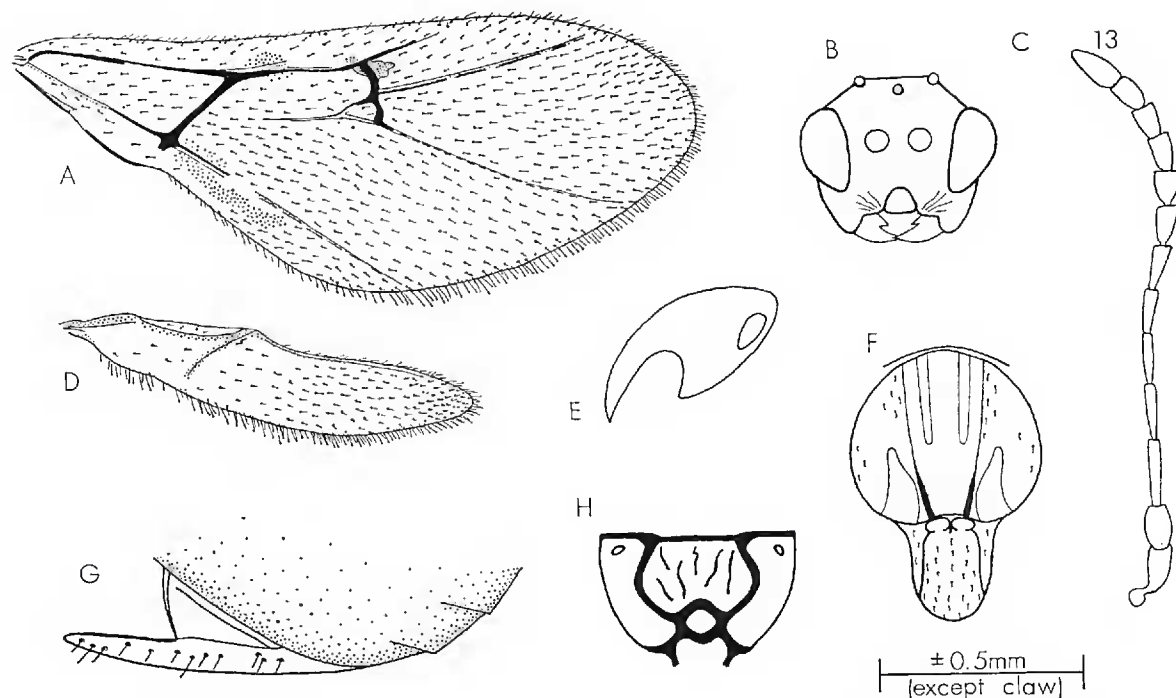


FIG. 1. *Andricus stellulus*, female. A. Front wing. B. Face. C. Antenna. D. Hind wing. E. Tarsal claw. F. Mesonotum and scutellum. G. Hypopygium. H. Propodeum.

Cajon Pass, has never seen galls of *A. stellulus*. Weld (1957, fig. 101.) collected galls which appear to be the same as those of *A. stellulus* on Santa Catalina Island during March, but was unable to rear the adults. Discovery of the alternate generation, should one exist, may aid in establishing a more extensive distribution.<sup>1</sup>

### *Andricus stellulus*, new species

**HOLOTYPE FEMALE** (Fig. 1A-H).—*Head*: transverse from above, coriaceous, as wide as thorax; occiput flat; cheeks not broadened behind eyes; vertex slightly projected as a truncate cone, base laterally extended to ocular sutures, several small humps in area of dorsal ocelli (Fig. 1B); malar space  $0.37 \times$  eye height, without groove, few striae from corners of clypeus (Fig. 1B); interocular space broader than high; antenna filiform, 13-segmented, 3 longer than 4. *Thorax*: mesonotum coriaceous, with scattered hairs, glassy near anterior margin; notaulices percurrent, wider behind, no median groove, lateral lines shining (Fig. 1F); scutellum pubescent; disc pebbly, pubescent, margined on sides, longer than wide; foveae smooth, partly striate, smooth and shining below; tarsal claw with strong tooth (Fig. 1E); propodeal carinae bent outward, enclosed area bare, shining, dark, slightly rugose (Fig. 1H). *Wings*<sup>2</sup>: hyaline, pubescent, margin ciliate;  $Rs_1$  arcuate and infuscated;  $Rs_2$  slightly curved; areolet  $\frac{1}{6}$  length of  $Rs + M$  vein projected to basalis;  $R_1$ ,  $Rs_2$  and  $M$  veins not reaching wing margin; radial cell  $4 \times$

<sup>1</sup> D. C. Dailey, Sierra College, Rocklin California, kindly loaned galls and adults of *A. stellatus* from La Rumorosa and El Condor, Baja California Norte, after this manuscript was submitted for publication.

<sup>2</sup> Wing venation terminology follows the Comstock-Needham system as corrected for the Cynipidae by Eady and Quinlan, 1963.

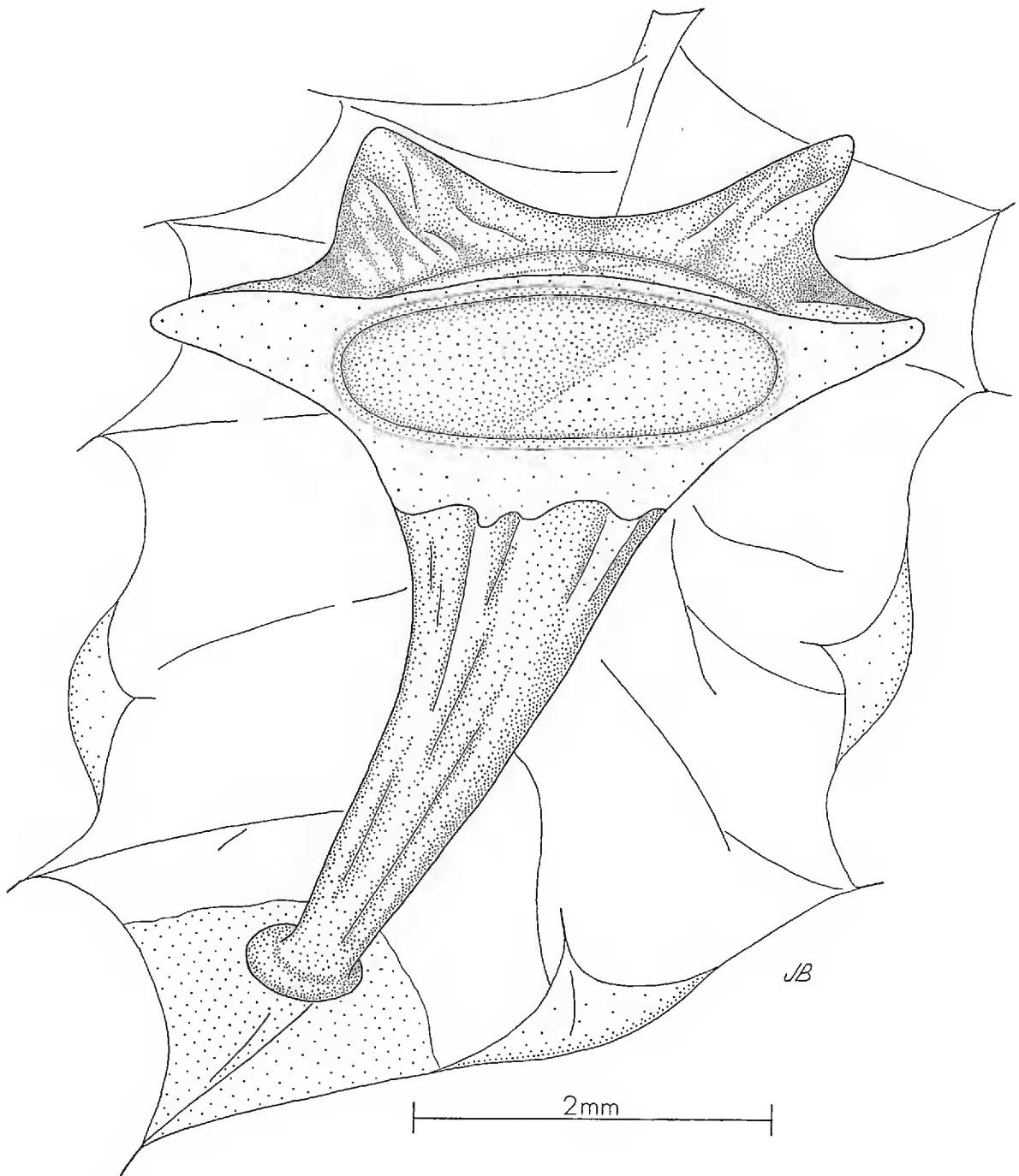


FIG. 2. Gall of *Andricus stellulus*, larval capsule exposed.

as long as broad (Fig. 1A). *Abdomen*: as high as long, long as head and thorax combined; tergites II, III, IV visible from above; tergite II pubescent and micropunctate at base; tergites III–VII micropunctate, VII sparsely pubescent; length of tergites along dorsal curvature as 43 : 12 : 5 : 4 : 4; ventral spine  $4.5\times$  as long as broad in side view, slightly pubescent beneath (Fig. 1G). *Color*: head and thorax rufescent; legs yellow-brown; abdomen brown; flagellum black; proximal wing veins dark brown, apically evanescent. Using width of head as base, mesonotum ratio = 1.0, antenna = 2.6, wing = 4.7. Range in length of 30 specimens 1.5–2.2 mm, average 1.85 mm.

*Gall* (Fig. 2).—Pedicellate, monothalamous, occurring singly (infrequently clumped) on either dorsal or ventral surface. Exterior of stalk rugose, delicately reticulate to glabrous on disc; green with occasional red and yellow markings when

fresh, brown or black at maturity. Parenchyma composed of amorphous crystalline cells, continuous with nutritive layer of larval capsule. Disc: four to six pointed around perimeter, supported by slender stalk, reticulate with fine striations radiating from central darkened spot on upper surface; varies from ovoid to cupped in profile; diameter, 1.6–2.3 mm; depth, 0.6–1.2 mm, centrally supported on stalk; except for projections, completely filled by inseparable larval capsule. Stalk: diameter, 0.56–0.74 mm near disc, tapering to 0.21–0.38 mm in diameter at point adjacent to basal ring; length 1.7–3.1 mm; tissue continuous internally, but not densely compacted; attached to leaf-blade vein by slightly enlarged basal ring. Galls usually stand upright on leaf surface. Height range of 30 galls 2.3–5.6 mm.

*Host*.—*Quercus dumosa* Nutt.

*Holotype female* and gall, summit of Cajon Pass, ½ MI. So. of Oak Hill Road, San Bernardino Co., California, 12 January 1974, J. A. Burnett. Deposited in U.S. National Museum. Paratype females and galls deposited in U.S. National Museum, Washington, D.C.; California Academy of Science, San Francisco, California; University of California, Riverside; Weld collection in possession of Mr. Robert J. Lyon, Los Angeles, California; the author's collection.

Variation of color, wing venation and pubescence was observed in the type series of *A. stellulus*. Color ranges from rufescent on head and thorax, legs yellow-brown, abdomen amber dorsally and progressively darker toward ovipositor valves, to an entire uniform brown, except flagella which are always dark brown or black. The areolet of the wing varies from ⅓ of the length of Rs + M projected to the basalis, to almost obsolete. Pubescence on the face, occiput and sides of pronotum may be of sparse or medium density.

*A. stellulus* keys out in couplet 58 in the generic keys of Weld's Cynipoidea (Weld, 1952) to the genus *Andricus* and is separated from the genus *Liadora* by its coriaceous mesoscutum, outward-bent propodeal carinae and in having more than two abdominal tergites visible in side view. *A. stellulus* appears to be closely related to *Andricus parmula* Bassett as is evidenced by similarities in adult morphology, host preference and certain shared gall characteristics. The adult female of *A. parmula* differs from that of *A. stellulus* in having a laterally compressed abdomen, amber wing venation and notaulices which are anteriorly obsolete.

Galls of *A. parmula* occur on leaves of *Q. dumosa* at Cajon Pass, but have also been recorded from numerous Pacific-coast localities on *Quercus lobata* Nee, *Quercus douglasii* Hooker & Arnott, *Quercus engelmannii* Greene, *Quercus garryana* Douglas and *Quercus durata* Jepson (Weld, 1957). The galls of both *A. stellulus* and *A. parmula* frequently occur on the same leaf at the type locality where *Q. dumosa* is the host. The larval capsule is housed in a compressed disc (*A. parmula*) which is similar in size, color, texture and internal structure to the

gall-disc of *A. stellulus*, but lacks the peripheral projections and basal stalk which make the gall of the latter species distinctive.

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- EADY, R. D. AND J. QUINLAN. 1963. Handbook for the Identification of British Insects, (Hymenoptera: Cynipidae), Key to Families, Subfamilies and Cynipinae. (Including Galls). Royal Entomol. Soc. London, 7 pt. 1A: 81 pp.
- WELD, L. H. 1952. Cynipoidea (Hym.) 1905-1950. Priv. Pub., Ann Arbor, Mich. 351 pp.
- WELD, L. H. 1957. Cynipid Galls of the Pacific Slope. Priv. Pub., Ann Arbor, Mich. 64 pp.